A longitudinal study of externally visible cigarette advertising on retail storefronts in Massachusetts before and after the Master Settlement Agreement

C C Celebucki, K Diskin

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See end of article for authors' affiliations

Correspondence to: Carolyn Celebucki, Massachusetts Department of Public Health, Massachusetts Tobacco Control Program, 250 Washington Street, 4th Floor, Boston, MA 02108, USA; carol.celebucki@state.ma.us

Objectives: To assess the effect of the Master Settlement Agreement (MSA) on the amount of cigarette advertisements visible from outside of over-the-counter tobacco retailers, for five specific premium brands and an "all other" category, for five types of establishments, and in three areas (windows/doors, building/other detached areas, and sidewalks); to assess the relation of total exterior retail cigarette advertising to illegal sales to youth.

Methods: Observations were conducted on the number of cigarette advertisements visible from outside tobacco retail establishments in a paired convenience sample (n = 556) in Massachusetts before and after the MSA. Archival databases containing information on merchant compliance with age related sales laws during the time period were used to assess the relation of total cigarette advertising with sales to underage youth. Paired sample *t* tests assessed planned comparisons pre- to post-MSA; Spearman's ρ tested associations for dichotomous variables.

Results: Significant post-ban increases were observed in the prevalence of exterior cigarette advertising on gas (petrol) stations and gas mini/marts (gasoline retailers) buildings, windows, and doors. Significant declines were observed on windows of liquor stores. Winston advertising declined overall, while advertisements of the "all other" brand category increased. Correlations between advertising and illegal sales, while modest, were significant.

Conclusions: These pre- to post-MSA increases suggest the tobacco industry may be shifting expenditures selectively from billboard advertising to retailer exteriors more favoured by youth. Greater amount of cigarette advertising visible from outside over-the-counter tobacco retailers is associated with greater cigarette sales to minors.

Tobacco products are among the most heavily advertised and promoted products in Massachusetts.[1–3] Young people are exposed to substantial advertising and promotion of tobacco products.[1 2 4 5] Cigarette advertising for the youth preferred brands (Marlboro, Newport, Camel, and Winston[6 7]) is pervasive in magazines with high youth readership[8] and on retail establishments.[1 5] Likewise, advertising for brands popular with minority youth is higher in magazines with higher minority youth readership[9] and in communities with higher minority populations.[1] More cigarette advertisements are visible from the outside of establishments where Massachusetts' youth report regular purchase of cigarettes[1]—that is, gas (petrol) stations/gas mini-marts and convenience stores.[6] Nationally, youth who purchase cigarettes report similar patterns and middle school youth (6th, 7th, and 8th grades) are as likely as high school youth to purchase cigarettes from gasoline selling establishments, but less likely than high school students to purchase from convenience stores.[10] Furthermore, cigarette advertising and promotions increase the risk of younger people smoking[5 11 12] while exposure to certain anti-tobacco advertising reduces that risk.[13 14]

The Master Settlement Agreement (MSA)[15] signed by the four major cigarette manufacturers and the states' attorneys general in November 1998 has as a goal reduction in youth smoking rates. Several provisions that ban or limit exterior advertising in terms of size, placement, and audience composition address involuntary youth exposure to tobacco advertising, specifically: billboard and transit advertising are banned, and the size of exterior advertisements on storefronts is limited to 14 square feet. Payments to states are linked to reduction in youth smoking, while payments by the four largest tobacco companies are linked to their combined total market share.

However, cigarette advertising significantly increased in magazines with high youth readership when comparable quarters immediately preceding and following the MSA were analysed.[16] This strongly suggests some redirecting of the monies previously spent on outdoor advertising, now banned by the MSA, into venues that ensure youth exposure.

While the MSA does not specifically ban cigarette advertisements visible from the outside of stores, if the tobacco industry were intent on reducing youth smoking prevalence, cigarette advertising might be expected to decrease post MSA. With the demise of federal and state regulatory prohibitions designed to reduce youth involuntary exposure to cigarette advertising (that is, Food and Drug Administration (FDA)[2] and Massachusetts Regulation 940[17]), it is important to assess whether youth have actually benefited from the retail advertising restrictions of the MSA.

In a representative sample of storefronts in the USA, Wakefield and colleagues reported increases in the percentages of vendors with any tobacco advertising and with higher amounts of tobacco advertising in the three months after the MSA as compared to the three months before.[18]

A study (Operation Storefront) of externally visible storefront tobacco advertising (cigarettes, cigars, chew), in which the authors analysed a convenience sample of 2840 (39%) over-the- counter tobacco retailers (OTCTR) in Massachusetts,[1] formed the basis for the present study. This paper reports on changes in the number and placement of cigarette advertisements visible from the outside of OTCTRs in a paired sample (n = 556) surveyed in the first quarter 1998 (pre-MSA) and again in the last quarter of 2000 (post-MSA).

METHODS

We tested the following questions:

(1) Has externally visible cigarette advertising increased since the signing of this agreement, especially in establishments frequented by youth?

(2) Have brands with extensive billboard advertising pre-MSA redirected resources to retailer storefronts including windows, buildings and sidewalks?

(3) Are retailers with more externally visible cigarette advertising more likely to sell to underage youth?

We assessed: (1) the changes in the mean number of cigarette ads for each brand/category by placement (building and detached area, sidewalk, windows and doors) visible from outside of five different types of tobacco retail establishments—that is, convenience, grocery, liquor, pharmacy and gas station/gas mini-marts (referred to here as gasoline retailers); (2) change in the mean totals for cigarette brands having high billboard expenditures pre-MSA; and (3) the relation of total cigarette advertising to illegal sales of cigarettes to youth.

Data complied by Competitive Media Reporting[19] were used to determine cigarette brands with extensive billboard expenditures pre-MSA (that is, Marlboro, Camel, and Kool). Four teams of one or two youths and one adult were trained according to the same protocol as in 1998 (time 1 protocol),[20] and openly collected identical information for the premium brands originally counted—that is, the top five ranked ordered by Massachusetts youth who smoke Marlboro, Newport, Camel, Winston, and Kool,[6] as well as two additional brands, Parliament and Lucky Strike, with changed ad campaigns during this time period. Cigarette advertisements, which included any incidence of brand or generic advertising, were counted for each of the three distinct areas of exterior advertising: (1) buildings and detached area (parking lots, fences, gas pumps, etc); (2) sidewalks; (3) windows and doors (which included advertisements affixed to the interior glass to be viewed from outside). Each of the seven specified brands of cigarettes was counted independently and any other cigarette brand was recorded in an "all other" category. Parliament and Lucky Strike were later recoded into the "all other" category to conform to the time 1 protocol. Two team members verified all counts and in all but one instance, pictures were taken. Printed information describing the advertising study was available for the merchant upon request, but was not offered in advance. Data entry, checking, and analyses were conducted or supervised by the authors.

We developed the paired sample from the original time 1 sample in a three step process (figs 1 and 2). Firstly, OTCTR data excluding department stores (n =4 2) collected pre-MSA (n = 2798) were cross matched against an archival database of results of underage purchase attempts from independent, representative samples of Massachusetts tobacco vendors collected annually during the same period (October 1997 through September 2000). The sample methodology and protocol for conducting these checks conform to federal monitoring requirements, is consistent over time, and is described in depth elsewhere.[20] Briefly, a randomised cluster design with stratification on geographic region and tobacco control funding status was utilised with census of all tobacco vendors located in the (randomly) selected clusters. OTCTRs that had not been subject to a compliance check in the previous three years (n = 1404) were eliminated. For vendors with checks in multiple years, the most recent outcome (sale or no sale) was used. This allowed us to assess the overall relation between retailers' illegal cigarette sales and the average amount of externally visible cigarette advertising.

Secondly, we stratified on whether or not a picture was taken at time 1 and oversampled those without (64% *v* 50%). Since picture taking was optional in the original study, we were concerned that the communities not taking pictures were perhaps less organised in their tobacco control effort. This produced a sample of 758 establishments to be surveyed at time 2. Thirdly, to minimise the likelihood that changes detected pre- and post-MSA were the result of a change in ownership, franchise or type of store (which might affect the display of advertising and the propensity to sell to underage youth), all identifier information (establishment name, address, type, and franchise) collected at time 2 had to match that recorded at time 1. The resulting convenience sample of 556 tobacco retailers (73% response rate) accounts for approximately 9% of all Massachusetts OTCTRs. Table 1 displays the number and percentages of establishments in Operation Storefront, the derived sample, and the paired sample for each of the five establishment types (convenience, grocery, liquor, pharmacy, and gasoline retailers) as well as the illegal sales rate for each type of establishment from archival data.

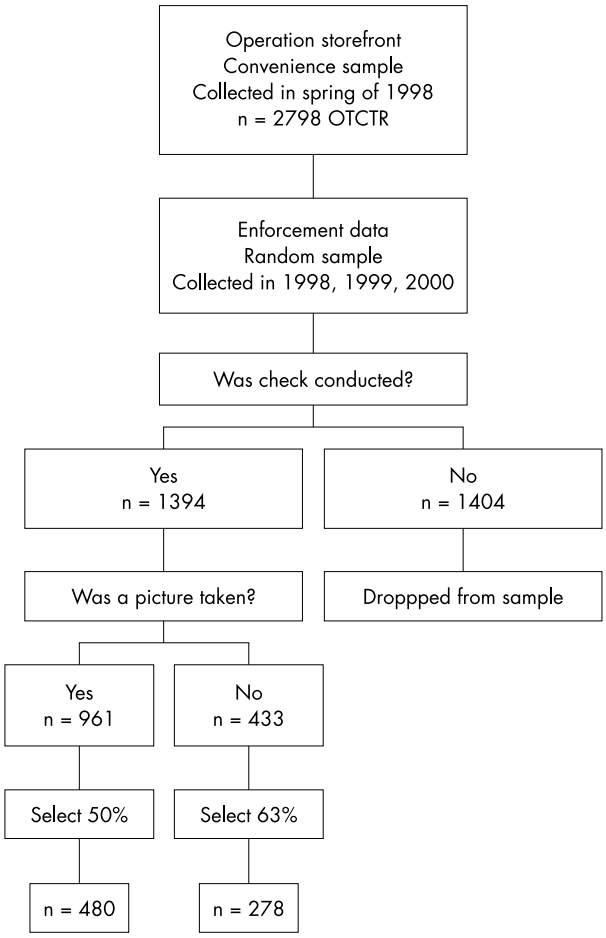

Figure 1 Decision tree for derivation of time 2 sample.

Planned comparisons, tested with a series of paired sample *t* tests conducted in SAS version 8.1, assessed changes in mean number of cigarette advertisements pre- and post-MSA overall, by selected brands, exterior placement, and type of establishment. Spearman's ρ tested the strength of association for dichotomous variables, and χ^2 tests assessed the comparability of the samples (Operation Storefront, derived sample, matched sample).

RESULTS

The proportions of the five types of establishments as tested by χ^2 analyses are comparable across all samples.

Changes in cigarette advertising

Table 2 presents the mean number of cigarette advertisements for the matched sample of 556 over-the-counter retail tobacco vendors by brand (Marlboro, Newport, Camel, Winston, Kool) and "all others", exterior placement (building/*detached*, sidewalk, windows/*doors*), and type of establishment. Subtotals are

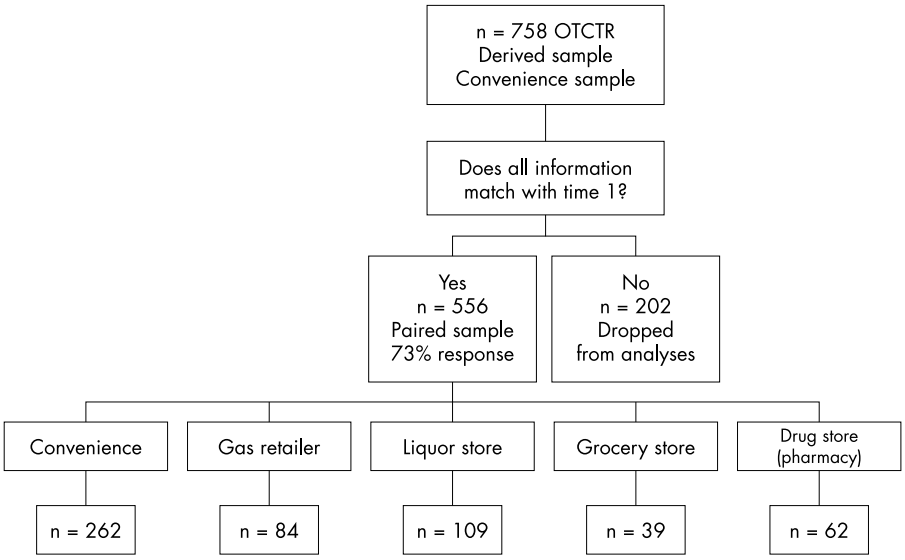

Figure 2 Decision tree for paired sample time 2.

provided for each brand by placement, type by placement (far right hand column), and overall totals for brand, type, and placement at time 1 (pre-MSA) and time 2 (post-MSA). The time 1 to time 2 increase in externally visible cigarette advertising is 9%. Most cigarette advertisements were found on windows (80%) pre- and (79%) post- MSA, but the greatest percentage increase pre- to post-MSA was found for buildings (15%). The increase on buildings of gasoline retailers was over 200% and this type of retailer had the greatest percentage increases overall (56%).

Table 3 summarises the significant results. Externally visible cigarette advertisements on retail establishments have increased pre- to post-MSA for the brand category "all others" and decreased for Winston. These changes are driven primarily by changes on windows. Increases in total cigarette advertising was marginally significant ($p = 0.07$, data not shown).

Increases from time 1 to time 2 in the overall amount of externally visible cigarette advertisements were revealed for establishments where youth regularly purchase cigarettes—for example, gasoline retailers—and were significant overall, on buildings and windows.

Brands categories with increased exterior advertising on gasoline retailers included "all others", Camel, Kool, and Newport. Marlboro advertisements significantly increased on the buildings of gasoline retailers and results were suggestive for sidewalks (pavements) as well ($p = 0.072$, data not shown). Close to threefold increases are found on buildings of gasoline retailers when the three brands with strong billboard presence pre-MSA (Marlboro, Camel, and Kool) are combined; findings were also suggestive that Kool increased advertising pre- to post-MSA ($p = 0.068$, data not shown). Increases in advertising on windows for gasoline retailers were found for "all others", Camel, and Newport. All other brands also showed significant increases on convenience store windows.

While we found no significant reductions in total cigarette advertising visible from outside of any type of establishment, significantly fewer Camel ads were visible from outside of liquor stores post- versus pre-MSA, with declines in Kool ($p = 0.050$) and Winston ($p = 0.057$) marginally significant (data not shown). The significant declines revealed on the windows of liquor stores were attributable to changes in Winston, Camel, and Kool. Similarly, convenience stores exhibited declines in Winston and Newport advertising with reductions somewhat suggestive for Camel ($p = 0.07$, data not shown). Significant declines in Winston advertising occurred both on buildings and windows of this establishment type.

Relation of advertising to illegal sales

Overall around 15% of minors who attempted to purchase cigarettes from these establishments were successful, although the rate varied with type of establishment as shown in table 1.

Although the effect is modest, it is evident that average amounts of cigarette advertising and illegal sales rates recorded across the period of this study are correlated ($\rho(555) = 0.097$, $p = 0.022$). While none reached significance, within type correlations (with the exception of drug stores) were positive and consistent with the overall results ($\rho(61) = -0.137$, $p = 0.29$; $\rho(261) = 0.02$, $p = 0.76$; $\rho(38) = 0.097$, $p = 0.56$; $\rho(83) = 0.101$, $p = 0.36$; $\rho(108) = 0.138$, $p = 0.15$.)

DISCUSSION

Results of this study cannot be generalised to all of Massachusetts, as the convenience sample, which formed the

Table 1 Sample characteristics by type of establishment

	Operation Storefront		Sample		Matched sample		
	n	%	n	%	n	%	Illegal sales (%)
Convenience Store	1194	43	358	47	262	47	18.3
Gasoline retailers	564	20	133	18	84	15	17.9
Grocery store	290	10	69	9	39	7	7.7
Liquor store	508	18	127	17	109	20	8.3
Pharmacy/drug store	242	9	71	9	62	11	12.9
Totals	2798	100	758	100	556	100	14.9

Table 2 Mean number of cigarette ads on buildings, sidewalks, windows, and combined by establishment

	Marlboro		Camel		Winston		Kool		Newport		All other brands		Totals	
	Time		Time		Time		Time		Time		Time		Time	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Buildings														
Convenience store	0.256	0.221	0.153	0.073	0.168	0.069*	0.061	0.057	0.160	0.122	0.221	0.237	1.019	0.779
Grocery store	0.026	0.026	0.000	0.000	0.077	0.000	0.000	0.000	0.051	0.000	0.000	0.051	0.154	0.077
Liquor store	0.128	0.101	0.000	0.000	0.009	0.018	0.000	0.018	0.018	0.028	0.037	0.073	0.193	0.239
Pharmacy/drug store	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gasoline retailers	0.179	0.595*	0.095	0.298	0.095	0.286	0.024	0.226	0.000	0.107	0.226	0.440	0.619	1.952*
Totals	0.174	0.216	0.086	0.079	0.101	0.079	0.032	0.065	0.083	0.079	0.146	0.196	0.622	0.714
Sidewalk														
Convenience store	0.095	0.126	0.027	0.015	0.023	0.015	0.004	0.015	0.004	0.015	0.034	0.034	0.187	0.221
Grocery store	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Liquor store	0.009	0.055	0.009	0.018	0.018	0.018	0.046	0.037	0.009	0.000	0.037	0.101	0.128	0.229
Pharmacy/drug store	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gasoline retailers	0.417	0.179	0.024	0.048	0.060	0.036	0.024	0.024	0.000	0.036	0.179	0.214	0.702	0.536
Totals	0.110	0.097	0.018	0.018	0.023	0.016	0.014	0.018	0.004	0.013	0.050	0.068	0.219	0.230
Windows														
Convenience store	1.603	1.710	0.656	0.618	0.905	0.653*	0.355	0.462	0.668	0.508	0.981	1.821****	5.168	5.771
Grocery store	0.179	0.205	0.128	0.103	0.154	0.077	0.077	0.000	0.128	0.179	0.077	0.256	0.744	0.821
Liquor store	0.789	0.587	0.394	0.147**	0.431	0.257*	0.257	0.110*	0.367	0.229	0.385	0.523	2.624	1.853*
Pharmacy/drug store	0.048	0.097	0.016	0.000	0.016	0.000	0.000	0.016	0.032	0.000	0.065	0.032	0.177	0.145
Gasoline retailers	1.238	1.333	0.119	0.345*	0.476	0.393	0.167	0.310	0.048	0.179**	0.607	1.167**	2.655	3.726*
Totals	1.115	1.147	0.415	0.379	0.595	0.423**	0.248	0.288	0.406	0.324	0.642	1.158****	3.423	3.719
Combined														
Convenience store	1.954	2.057	0.836	0.706	1.095	0.737**	0.420	0.534	0.832	0.645*	1.237	2.092****	6.374	6.771
Grocery store	0.205	0.231	0.128	0.103	0.231	0.077	0.077	0.000	0.179	0.179	0.077	0.308	0.897	0.897
Liquor store	0.927	0.147	0.404	0.165**	0.459	0.147	0.303	0.147	0.394	0.147	0.459	0.147	2.945	0.147
Pharmacy/drug store	0.048	0.097	0.016	0.000	0.016	0.000	0.000	0.016	0.032	0.000	0.065	0.032	0.177	0.145
Gasoline retailers	1.833	0.345	0.238	0.690*	0.631	0.345	0.214	0.560*	0.048	0.321**	1.012	1.821**	3.976	6.214*
Totals	1.399	1.460	0.520	0.477	0.719	0.518**	0.295	0.371	0.493	0.415	0.838	1.423****	4.264	4.664

*p<0.05; **p<0.01; ***p<0.001; ****p<0001

Table 3 Summary of results of paired *t* test

Establishment	Location	Brand category	Time 1	Time 2	df	*t*	p Value	Time 2 change
All establishments	Exterior overall	All other	0.84	1.42	555	6.22	<0.0001	0.690
		Winston	0.72	0.52	555	–3.1	0.002	–0.278
	Windows/doors	All other	0.64	1.16	555	6.07	<0.0001	0.813
		Winston	0.59	0.42	555	–2.95	0.003	–0.288
Gasoline retailers	Exterior overall	Total	3.97	6.21	83	2.57	0.011	0.564
		All other	1.01	1.82	83	3.07	0.003	0.802
		Camel	0.238	0.69	83	2.53	0.014	1.899
		Kool	0.214	0.56	83	2.06	0.042	1.617
		Newport	0.048	0.32	83	2.73	0.008	5.667
	Building	Total	0.619	1.95	83	2.23	0.028	2.150
		Marlboro	0.179	0.595	83	1.99	0.049	2.324
		Marl/Camel/Kool	0.298	1.12	83	2.02	0.046	2.758
	Windows/doors	Total	2.65	3.73	83	2.34	0.022	0.408
		All other	0.607	1.167	83	2.87	0.005	0.923
		Camel	0.119	0.345	83	2.51	0.014	1.899
		Newport	0.048	0.179	83	2.97	0.004	2.729
Liquor stores	Exterior overall	Camel	0.404	0.165	108	–2.9	0.005	–0.592
	Windows/doors	Total	2.62	1.85	108	–2.18	0.031	–0.294
		Winston	0.431	0.257	108	–2.23	0.027	–0.404
		Camel	0.394	0.147	108	–2.89	0.005	–0.627
		Kool	0.257	0.11	108	–2.31	0.023	–0.572
Convenience	Exterior overall	All other	1.24	2.09	261	5.21	<0.0001	0.685
		Winston	1.095	0.737	261	–3.42	0.0007	–0.327
		Newport	0.832	0.645	261	–2.23	0.029	–0.225
	Windows/doors	All other	0.98	1.82	261	5.34	<0.0001	0.857
		Winston	0.905	0.653	261	–2.27	0.018	–0.278
	Building	Winston	0.168	0.069	261	–2.32	0.021	–0.589

basis of the longitudinal study, is not representative and may favour areas with more active tobacco control. This could underestimate any increase in exposure as the more active communities may be more likely to seek voluntary reduction in storefront advertising or enforce community zoning or safety concerns that would affect cigarette advertising as part of all exterior advertising. No interior advertising (other than that affixed to windows and doors and meant to be viewed from outside the store), promotional items, catalogues, displays or functional items were counted in this study and we may therefore be underestimating the amount of youth exposure in Massachusetts. Wakefield and colleagues[18] documented increases in interior as well as exterior exposure pre- and post-MSA.

Longitudinal studies are subject to selection bias. Although no sample differences were detected, the matching criteria we employed may further advantage the more established stores or the more stable neighbourhoods. We believe that the disadvantages in our conservative approach are more than offset by our ability to infer that if exterior tobacco advertising has not decreased among these vendors, it is unlikely that it has decreased in any group of vendors; and that changes over time in exterior retail cigarette advertising are less likely caused by individual differences in establishments than by environmental pressures, either pro- or anti-tobacco control.

While it is true that many of the 27 significant results of the 120 planned paired comparisons would not survive a conservative correction for inflated α error, and chance alone could be expected to produce six significant results, random fluctuations should be distributed across all five types of storefronts and all three external areas. Furthermore, they should be equally likely to produce decreases as increases. This was not the case. We found over four times as many significant results as could be expected by chance alone, and increases (16) outnumbered decreases (11) by a margin of close 3 to 2; this ratio was slightly greater when considering only those with a probability level of $p < 0.01$ (8 to 5). Although the overall change in total cigarette advertising (9%) is comparable to that found by Wakefield and somewhat suggestive of increases ($p = 0.078$), and the increase in "all others" reached significance, this masks differences by brands, establishments, and placement which can differentially impact youth exposure. With the exception of Winston, there is no evidence that youth are less exposed to any externally visible cigarette brand advertisement after the MSA than before. Planned comparisons provide evidence that two years after the MSA, youth are still at risk for continued involuntary exposure from external retail cigarette advertising, particularly from gasoline retailers which have high rates of illegal sales and are often frequented by youth.[10] Retailers where youth prefer to purchase cigarettes (gasoline retailers and convenience stores) have increased their cigarette advertising exposure from time 1 to time 2, and the increase is significant and substantial (150%) for gasoline retailers. Changes in brand/category exposure for convenience stores is mixed with increases for "all other", decreases in Winston and Newport, and suggested increases for Kool.

Although increases in total cigarette advertising were noted on buildings, sidewalks, and windows, results were significant only for the windows and buildings of gasoline retailers which, because of the size of their lots and placement of buildings (often stand alone with three exposed sides), may have more available space than convenience stores for replacement advertising redirected from the billboard campaign. Significant increases overall and on the buildings and windows of gasoline retailers are troubling as this may signal a move towards more expansive and far reaching advertisements with increased involuntary exposure for younger

impressionable children[21] in vehicles, especially when those brands with strong pre-MSA billboard campaigns are combined.

While the design of this study did not allow us to assess changes in size of cigarette advertisements, Wakefield and colleagues noted an 8% increase in vendors with any tobacco advertising post-MSA, but a 22% increase in those with "high" levels of tobacco advertising (five or more ads or at least one ad with a dimension of at least 1 foot (30 cm)); the greatest increase in "high" levels (32%) was noted in parking lots (exclusively found in gasoline retailers either with or without convenience stores).

Furthermore, a national study of youth access to tobacco products found middle school smokers as likely as high school smokers to purchase their cigarettes in gasoline retail establishments, but less likely to purchase in convenience stores.[10] Significant decreases in total cigarette advertising on windows occurred on liquor stores only. Liquor stores have reduced levels of cigarette advertising[1] and lower rates of illegal sales to minors relative to other tobacco vendors.[20] There is anecdotal evidence that liquor stores, experienced in age verification for alcohol sales and sometimes staffed by undercover police personnel, may have incorporated age checking for tobacco sales earlier than other establishments. Also, age verification is highly predictive of sales outcomes.[21] Furthermore, liquor stores in Massachusetts are also less likely to be within 1000 feet (300 m) of schools[1] and presumably less likely then to contribute to involuntary youth exposure.

It is probable that the restrictions on cigarette advertising near schools promulgated by Massachusetts (and the FDA) still influenced merchants during this time period. When one team was kept from taking pictures and left per instructions, another adult upon revisit found that all storefront advertisements had been removed. Upon inquiry, he was told "that the store was now in full compliance with all regulations". This shows not only the need for unobtrusive surveillance when conducting community based research, but the power of formal regulations and monitoring by a government entity. Unfortunately, any constraint exercised by individual vendors or the tobacco industry while awaiting the final decision of the Supreme Court is now unnecessary.*

Finally, while the effect size is modest, underage youth are more successful in obtaining cigarettes in establishments with greater amounts of cigarette advertisements. The association between amount of advertising and sales to youth is especially intriguing as buyer's age (older), lack of age verification, and self service displays are highly predictive of illegal sales.[20] It is possible that dependence on revenue from tobacco sales affects both the amount of advertising visible from the outside of stores, and the effort given to age verification. In related research, Cowling[22] found the type (tobacco industry, or tobacco control programme) of age notification sign displayed by tobacco merchants to be associated with differential rates of illegal sales to youth, with those vendors having only the industry sign most likely to sell to underage youth. It is probable that communities in California and Massachusetts with active tobacco control programmes that enforce age related sales laws also encourage the voluntary removal of cigarette advertisements as well as the display of non-industry tobacco control signs; vendors who voluntarily reduce advertisements may also be more careful about selling to youth. Youth who smoke may view stores that display only industry sponsored age requirement signs, or have greater amount of exterior cigarette advertising, as being more tobacco friendly and may then frequent these stores more often. More research is needed to understand this relationship better.

What is evident from our study is that advertising over this 30 month period in a well established sample of tobacco retailers is not static; that brands and establishments and even placement on establishments change. While we applaud any decrease in total cigarette advertising on the windows of retail establishments, the reduction on liquor stores that depend upon and cater to an adult clientele is more than offset by the increases in gasoline retailers that do not. The industry may not be specifically targeting youth, but exposure to storefront cigarette advertising has increased in spite of the MSA, and any residual effects during this collection period of the regulations promulgated by the FDA and the Commonwealth will likely diminish. We are also unsure how the recent withdrawal of Philip Morris advertising from magazines with substantial youth readership will impact upon the amount of externally visible Marlboro advertising, a brand which accounted for almost one third of the observed advertising and is overwhelmingly preferred by youth who smoke.[6] That cigarette advertising has not decreased post-MSA but has increased so dramatically in gasoline retailers calls into question the effectiveness of the MSA in reducing involuntary youth exposure, and begs that government regulation be strengthened and supported to protect youth from intended or unintended exposure.

What this paper adds

One goal of the Master Settlement Agreement (MSA) is to reduce youth smoking rates. It therefore contains provisions on the amount, size, and placement of exterior cigarette advertising allowed as well as the banning of tobacco ads on billboards and transit vehicles. One study, with cross sectional national surveys conducted three months before and three months after the effective date of the MSA external advertising and promotional restrictions, showed an increase in total (inside and outside of retail establishments) tobacco advertising and promotions pre- to post-MSA.

The present study examines changes in externally visible cigarette advertisements in a matched sample of established tobacco retailers in Massachusetts across a 30 month period, which extends the post-MSA collection date a year later from other studies. The results suggest that youth are still exposed to cigarette advertising externally visible from outside of retail storefronts in Massachusetts 18 months after the effective date, and documents changes consistent with reaching a youth audience—that is, significant increases in advertising on the windows of establishments where youth prefer to purchase cigarettes (gasoline retailers) and significant declines for establishments not preferred by youth (liquor stores) which have an age requirement of 21 for purchase of alcohol. During the period of the study, externally visible cigarette advertising was positively associated with illegal sales to underage youth.

Authors' affiliations
***C C Celebucki, K Diskin,** Massachusetts Tobacco Control Program, Massachusetts Department of Public Health, Boston, Massachusetts, USA

*Also Department of Psychology, University of Rhode Island, Rhode Island, USA

* Since the signing of the agreement, Massachusetts regulation 940, which mirrored the language of the FDA banning tobacco advertising within 1000 feet (300 m) of schools, was similarly enjoined and subsequently struck down by the US Supreme Court (June 2001).

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